AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) An apparatus for routing data between integrated circuit devices, comprising:

an ~~n-dimensional~~ two-dimensional grid of integrated circuit devices;

a plurality of communication networks coupling the ~~n-dimensional~~ two-dimensional grid of integrated circuit devices, ~~wherein a communication network of the plurality of communication networks moves data unidirectionally in only orthogonal dimensions~~ wherein the plurality of communication networks includes:

a first separate communication network configured to move data unidirectionally in a North direction and an East direction along communication lines used by only the first communication network;

a second separate communication network configured to move data unidirectionally in the North direction and a West direction along communication lines used by only the second communication network;

a third separate communication network configured to move data unidirectionally in a South direction and the East direction along communication lines used by only the third communication network; and

a fourth separate communication network configured to move data unidirectionally in the South direction and the West direction along communication lines used by only the fourth communication network; and

a routing mechanism configured to route data across the plurality of communication networks as well as into, out of, and through a given integrated circuit within the ~~n-dimensional~~ two-dimensional grid of integrated circuits;

whereby a process of routing ~~signals~~ data across a given communication network is greatly simplified because it is not possible to create a cycle that causes a deadlock within the given communication network; and

whereby the process of routing ~~signals~~ data yields a shortest path between source and destination.

2. (Original) The apparatus of claim 1, wherein the n-dimensional grid of integrated circuit devices includes memory devices.

3. (Original) The apparatus of claim 1, wherein the n-dimensional grid of integrated circuit devices includes processor devices, I/O devices, digital signal processors, field programmable gate arrays, sensors, and controllers.

4. (Cancelled)

5. (Original) The apparatus of claim 1, wherein the routing mechanism is configured to statically route data items across the plurality of communication networks.

6. (Original) The apparatus of claim 1, wherein the routing mechanism is configured to dynamically route data items through network junctions within each integrated circuit.

7. (Original) The apparatus of claim 1,

wherein a header attached to each data item in a two-dimensional grid indicates a number of horizontal steps and a number of vertical steps required for the data item to reach its destination; and

wherein during a dynamic routing process, the routing mechanism removes a horizontal step or a vertical step from the header for the data item, depending upon which direction is dynamically selected.

8. (Currently Amended) A method for creating a computing system, comprising:

creating ~~an n-dimensional~~ a two-dimensional grid of integrated circuit devices;

establishing a plurality of communication networks coupling the ~~n-dimensional~~ two-dimensional grid of integrated circuit devices~~, wherein a communication network of the plurality of communication networks moves data unidirectionally in only orthogonal dimensions~~, wherein establishing the plurality of communication networks involves;

establishing a first separate communication network configured to move data unidirectionally in a North direction and an East direction along communication lines used by only the first communication network;

establishing a second separate communication network configured to move data unidirectionally in the North direction and a West direction along communication lines used by only the second communication network;

establishing a third separate communication network configured to move data unidirectionally in a South direction and the East direction along communication lines used by only the third communication network; and

establishing a fourth separate communication network configured to move data unidirectionally in the South direction and the West direction along communication lines used by only the fourth communication network; and

providing a routing mechanism configured to route data across the plurality of communication networks as well as into, out of, and through a given integrated circuit within the ~~n-dimensional~~ two-dimensional grid of integrated circuits;

whereby a process of routing ~~signals~~ data across a given communication network is greatly simplified because it is not possible to create a cycle that causes a deadlock within the given communication network; and

whereby the process of routing ~~signals~~ data yields a shortest path between source and destination.

9. (Original) The method of claim 8, wherein the n-dimensional grid of integrated circuit devices includes memory devices.

10. (Original) The method of claim 8, wherein the n-dimensional grid of integrated circuit devices includes processor devices, I/O devices, digital signal processors, field programmable gate arrays, sensors, and controllers.

11. (Cancelled)

12. (Original) The method of claim 8, wherein the routing mechanism is configured to statically route data items across the plurality of communication networks.

13. (Original) The method of claim 8, wherein the routing mechanism is configured to dynamically route data items through network junctions within each integrated circuit.

14. (Original) The method of claim 8,

wherein a header attached to each data item in a two-dimensional grid indicates a number of horizontal steps and a number of vertical steps required for the data item to reach its destination; and

wherein during a dynamic routing process, the routing mechanism removes a horizontal step or a vertical step from the header for the data item, depending upon which direction is dynamically selected.

15. (Currently Amended) A means for routing data between integrated circuit devices within ~~an n-dimensional~~ a two-dimensional grid of integrated circuit devices, comprising:

a communication means comprising a plurality of communication networks coupling the ~~n-dimensional~~ two-dimensional grid of integrated circuit devices, wherein ~~a communication network of the plurality of communication networks moves data unidirectionally in only orthogonal dimensions~~

a first separate communication network moves data unidirectionally in a North direction and an East direction along communication lines used by only the first communication network;

a second separate communication network moves data unidirectionally in the North direction and a West direction along communication lines used by only the second communication network;

a third separate communication network moves data unidirectionally in a South direction and the East direction along communication lines used by only the third communication network; and

a fourth separate communication network moves data unidirectionally in the South direction and the West direction along communication lines used by only the fourth communication network; and

a routing means for routing data across the plurality of communication networks as well as into, out of, and through a given integrated circuit within the ~~n-dimensional~~ two-dimensional grid of integrated circuits;

whereby the means of routing ~~signals~~ data yields a shortest path between source and destination.

16. (Original) The means of claim 15, wherein the n-dimensional grid of integrated circuit devices includes memory devices.

17. (Original) The means of claim 15, wherein the n-dimensional grid of integrated circuit devices includes processor devices, I/O devices, digital signal processors, field programmable gate arrays, sensors, and controllers.

18. (Cancelled)

19. (Original) The means of claim 15, wherein data is configured to statically routed across the plurality of communication networks.

20. (Original) The means of claim 15, wherein data is dynamically routed through network junctions within each integrated circuit.

21. (Original) The means of claim 15,

wherein a header attached to each data item in a two-dimensional grid indicates a number of horizontal steps and a number of vertical steps required for the data item to reach its destination; and

wherein during a dynamic routing process, a horizontal step or a vertical step is removed from the header for the data item, depending upon which direction is dynamically selected.